

### REMARKS

Claims 12-21 are pending in the present application and stand rejected. In the Office Action, the Examiner rejected claims 12-16 and 19-20 based on 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 3,777,480 to Stoltman, in view of U.S. Patent No. 3,777,479 to Hagen.

The Stoltman patent discloses a fuel control system for gas turbine engines which is particularly suited for use with engines of the gas-coupled type (e.g. vehicle propulsion). The disclosed system receives an input of the gas generator speed  $N_2$  and an input of the compressor discharge pressure 102 for use in positioning valve groups 67 and 68 of fuel control system 22, respectively.

The Hagen patent discloses a control system for gas turbines which include a gas generator associated with variable geometry unit such as variable stator guide vanes positioned upstream of the free power turbine. The Hagen control system adjusts the working line of the gas generator to each related speed by variation of the geometry in order to avoid the compressor surge line.

In contrast, independent claim 12 of the present application recites a fuel control method for gas turbines having a compressor and a gas generator which includes the steps of:

- a) measuring a plurality of engine operating parameters;
- b) determining an initial engine fuel demand based on the plurality of measured engine operating parameters;
- c) **estimating during engine operation and based on the plurality of measured operating parameters, an amount of heat transferred between fuel combustion gases and engine metal;**

- d) estimating an effective fuel flow adjustment based on the estimated heat transfer between the combustion gases and the engine metal; and
- e) determining a final engine fuel demand based on the initial engine fuel demand and the estimated effective fuel flow adjustment.

Neither Stoltman nor Hagen disclose a fuel control system which adjusts the initial fuel demand that has been determined based on engine operating parameters, such as gas generator speed and compressor discharge pressure, to account for real-time thermodynamic engine effects. More specifically, neither of these references teach, suggest or disclose, either alone or in combination, a fuel control system that estimates during engine operation and based on the plurality of measured operating parameters, an amount of heat transferred between fuel combustion gases and engine metal. Nor do these references teach suggest or disclose a fuel control system which estimates an effective fuel flow adjustment based on the estimated heat transfer between the combustion gases and the engine metal and then determines a final engine fuel demand based on the initial engine fuel demand and the estimated effective fuel flow adjustment.

In the Office Action, the Examiner suggested that Hagen discloses at column 6, lines 46 to column 7, line 40, a means for estimating, during engine operation and based on a plurality of measure operating parameters and amount of heat transferred between fuel combustion gases and the engine metal. Applicants have thoroughly reviewed Hagen with specific emphasis on the cited text, and have found no teaching, suggestion or disclosure which concerns the accounting for the heat transferred between the combustion gases and the engine metal. Still further, Applicants have also reviewed the cited text which the Examiner suggests disclose a fuel control system which estimates an effective fuel flow adjustment based on the estimated heat transfer

between the combustion gases and the engine metal and then determines a final engine fuel demand based on the initial engine fuel demand and the estimated effective fuel flow adjustment and also finds these citations in Hagen to be absent such a teaching, suggestion or disclosure.

Therefore, it is respectfully submitted that claim 12 and all of the claims depending therefrom, namely claims 13-21, distinguish the present invention over Stoltman and Hagen, and withdrawal of the rejection is respectfully requested.

Claim 17 was rejected by the Examiner under 35 U.S.C. § 103(a) as being unpatentable over Stoltman and Hagen, as applied to claim 12 above, in further view of U.S. Patent No. 4,545,198 to Yoshida. Applicants note that the Yoshida patent does not cure the deficiencies of Stoltman and Hagen identified above with respect to claim 12. In particular, Yoshida does not disclose, suggest or teach a fuel control system that estimates during engine operation and based on the plurality of measured operating parameters, an amount of heat transferred between fuel combustion gases and engine metal. Nor does Yoshida teach, suggest or disclose a fuel control system which estimates an effective fuel flow adjustment based on the estimated heat transfer between the combustion gases and the engine metal and then determines a final engine fuel demand based on the initial engine fuel demand and the estimated effective fuel flow adjustment

Therefore, it is respectfully submitted that claim 17, by virtue of its dependency from claim 12, is in condition for allowance and an action acknowledging the same is respectfully requested.

Claims 18 and 21 were rejected by the Examiner under 35 U.S.C. § 103(a) as being unpatentable over Stoltman and Hagen, as applied to claim 12 above, in further view of U.S. Patent No. 6,244,039 to Sugishita et al. Applicants note that the Sugishita et al. patent does not cure the deficiencies of Stoltman and Hagen noted above with respect to claim 12. In particular Sugishita et

al. does not disclose, suggest or teach a fuel control system that estimates during engine operation and based on the plurality of measured operating parameters, an amount of heat transferred between fuel combustion gases and engine metal. Nor does Sugishita et al. teach, suggest or disclose a fuel control system which estimates an effective fuel flow adjustment based on the estimated heat transfer between the combustion gases and the engine metal and then determines a final engine fuel demand based on the initial engine fuel demand and the estimated effective fuel flow adjustment

Therefore, it is respectfully submitted that claims 18 and 21 by virtue of their dependency from claim 12, are in condition for allowance and an action acknowledging the same is respectfully requested.

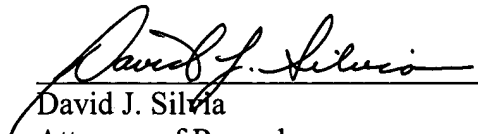
Applicants respectfully submit that all of the claims in this application, namely claims 12-21, are in condition for allowance, and such action is earnestly solicited.

If after reviewing this amendment, the Examiner believes that Applicants have not placed the application in condition for allowance, the undersigned attorney respectfully requests a telephone interview to facilitate the resolution of any remaining matters. The undersigned attorney may be contacted at the number set forth herein below.

Applicants respectfully request a two-month extension of time and have enclosed a check to cover the required fee. If any additional fees are required, the Commissioner is hereby authorized and requested to charge Deposit Account No. **04-1105**.

Respectfully submitted,

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David J. Silva  
Attorney of Record  
EDWARDS & ANGELL, LLP  
Intellectual Property Practice Group  
P.O. Box 9169  
Boston, MA 02209  
Telephone: (203) 353-6839